

PATENT ABSTRACTS OF JAPAN

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(71)Applicant : KONICA CORP

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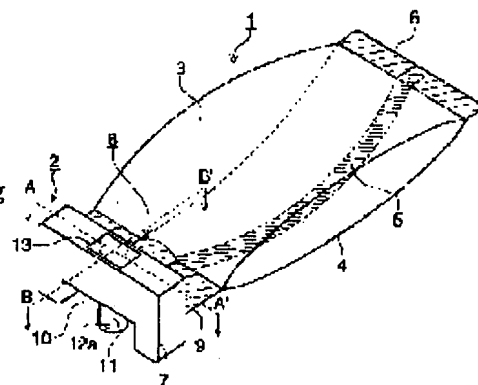
(72)Inventor : KONISHI KEIRI
YOMO SHINJI
SAITO MAKOTO

(54) INK CARTRIDGE

(57)Abstract:

PROBLEM TO BE SOLVED: To provide an ink container having an ink delivering section and an ink containing section where the residual quantity of ink can be confirmed visually without causing variation of oxygen transmittance in the handling process and the color of ink can be confirmed visually in order to prevent erroneous loading, and an ink cartridge containing that ink container for the purpose of reduction of environmental load.

SOLUTION: In the ink cartridge containing an ink container having an ink delivering section and an ink containing section, the ink containing section is made of a multilayer thermoplastic film including at least one inorganic deposition layer having rigidity of 7.9×10^{-7} – 1.9×10^{-7} Nm² wherein the mean transmittance is 88% or above and spectral transmission is 86% or above in the visible wavelength region.



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CLAIMS

[Claim(s)]

- [Claim 1] The ink cartridge characterized by being made from the thermoplastic film whose rigidity the average transmission coefficient of a visible wavelength field is 88% or more, and the spectral transmittance of a visible wavelength field is 86% or more, and is 7.9×10^{-7} to 1.9×10^{-7} Nm² in the ink cartridge which contained the ink container which has the ink derivation section and an ink stowage with the multilayer configuration film with which an ink stowage has at least one layer of inorganic vacuum evaporatio layers.
- [Claim 2] The ink cartridge according to claim 1 characterized by to have the ink takeoff connection which prepared opening which carries out punching opening with an ink supply means of an ink-jet recording apparatus to by which the ink derivation section consists of a joint which has ink installation tubing which joins the ink stowage attached to the base material and this base material, and an applied part to the ink feed zone of an ink jet recording apparatus, and is further positioned by [of this applied part and the ink feed zone of an ink jet recording apparatus] dashed, and being attached and hit against a field.
- [Claim 3] The ink cartridge according to claim 1 or 2 characterized by having arranged said two or more combination crevices for incorrect wearing prevention which dash and engage with a field peculiar to each ink feed zone of an ink jet recording device.
- [Claim 4] An ink cartridge given in any 1 term of claims 1-3 characterized by the wearing direction to the ink feed zone of an ink jet recording device being bottom Mukai.
- [Claim 5] An ink cartridge given in any 1 term of claims 1-4 characterized by the thickest part of a joint being 5-10mm.
- [Claim 6] An ink cartridge given in any 1 term of claims 1-5 characterized by loading a plinth for the ink stowage of an ink container holding horizontally, and being contained.
- [Claim 7] An ink cartridge given in any 1 term of claims 1-6 characterized by carrying an ink outflow auxiliary member on an ink stowage, and having contained.
- [Claim 8] An ink cartridge given in any 1 term of claims 1-7 characterized by the body of an ink cartridge being made of the paper board of a basis weight 300 - 700 g/m².
- [Claim 9] An ink cartridge given in any 1 term of claims 1-8 characterized by the ink cartridge body being made of corrugated paper.
- [Claim 10] An ink cartridge given in any 1 term of claims 1-9 characterized by having a window part with the means whose disconnection is enabled at the time of use since the ink residue of the ink container contained by the top face of an ink cartridge body is checked.
- [Claim 11] An ink cartridge given in any 1 term of claims 1-10 characterized by having the notching section with the means whose disconnection is enabled at the time of wearing in order to equip the inferior surface of tongue of an ink cartridge body with the ink derivation section of the contained ink container to the ink feed zone of an ink jet recording device.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the ink cartridge used for an ink jet recording apparatus.

[0002]

[Description of the Prior Art] Making the engine performance of ink itself, for example, viscosity, surface tension, etc. hold over a long period of time is mentioned so that an ink jet recording apparatus may be stabilized in the record paper and an alphabetic character, an image, etc. can be drawn as a function required of the ink container contained by the ink cartridge used for an ink jet recording apparatus. Moreover, it is also required that generating of air bubbles and lock out of the passage by the foreign matter should be prevented on the passage from an ink container to the ink jet printer head (henceforth a head) of an ink jet recording apparatus. Since ink does not flow with a natural thing when passage is blockaded with air bubbles, a foreign matter, etc., it does not escape white, or it will be in the condition that colors run short, and will stop becoming a product.

[0003] As a cure of the above-mentioned requirement, various cures have so far been taken. For example, the technique which prepared the air trap in order to make it the air bubbles generated in the ink tank in JP,53-10909,Y not go to a head, The technique of preventing penetration of air with the ink container which used the flexible film with a metal layer for JP,54-151033,A and 56-44669, The technique of decreasing a touch area with air by sticking an ink container and covering of isomorphism to JP,61-277459,A, The technique which used the aluminum lamination high polymer film for JP,62-121062,A as the quality of the material which excelled [container / ink] in gas barrier nature, The ingredient deaerated in order to decrease the amount of dissolved oxygen of the ink itself which penetration of the technique which uses a silica vacuum evaporatono film for an ink container, and the air from outside is prevented to JP,7-323559,A, and also is used, and the technique which fills up ink with the bottom of reduced pressure into a container are indicated.

[0004] Although surely the technique shown above showed a certain amount of effectiveness, there is with the technique which should still be satisfied. [no] For example, with the technique of preparing the air trap of a publication in JP,53-10909,Y, there is risk of the air bubbles with which it supplemented by that equipment becomes complicated and the air trap going to a head. With the ink container which used the film with a metal layer for JP,54-151033,A and 56-44669, it breaks with a container production process, a hole opens in a metal layer, and gas barrier nature is sometimes lost frequently. Although the technique which uses a silica vacuum-evaporatono film for the ink container indicated to JP,7-323559,A is the technique which surely took environmental correspondence into consideration compared with the old technique, and there is since it is quite good if it is compared with a crease of the metal layer produced in the handling process of an ingredient in which it has a metal layer, it is mentioned that a 2 silica vacuum-evaporatono layer with 1 yellow coloring tends to break firmly as a fault of a silica vacuum-evaporatono film. Since gas permeability became large when a crack arises in the silica vacuum evaporatono layer of a fold part in folding of a bag, handling, etc. when the multilayer film which carried out the laminating up and down using adhesives especially using the silica vacuum evaporatono film is made and a saccate container is produced, it had to be cautious of handling, costs started management, and it had also become the cause of a cost rise.

[0005] Moreover, the advance of a digital instrument is remarkable recently, red, yellow, blue, and black shade ink are prepared also in the color with same from being required the class of ink used for the ink jet recording device which the ink jet printer for visualizing those information is also set by them, and reappearance of elaboration is desired increasingly, and produces especially the image of large size performing color reproduction faithfully, and a total of eight colors are prepared.

[0006] Moreover, since producing the image of large size takes time amount, producing by Nighttime

uninhabited is common. Under the present circumstances, in order to avoid that an ink piece arises on the way, it changed to a new ink cartridge and correspondence is taken. The ink cartridge removed on the way is used for producing another image, when there is an operator. Since it stops becoming a product naturally when many various kinds of ink cartridges from which an ink residue differs in an actual work site since an ink cartridge is used in such the condition are held and ink is mistaken, the present condition is carrying out by paying careful attention on the occasion of exchange of an ink cartridge. Since especially the present ink cartridge is using the ingredient which has an aluminum foil layer in order to stop oxygen permeability low, it is impossible to look at the color of ink by the direct eye. Moreover, since surely it has absorption in 380-500 micrometers although a residue can be checked by the eye when the ingredient which has a silica vacuum evaporation layer is used, it is coloring and there is risk of mistaking for deep yellow especially in the case of the ink of light yellow, the present condition is checking the color of the seal currently stuck on the external surface of an ink cartridge, or a display, and it being fully careful, and exchanging.

[0007] Moreover, even when these ink of the ink of the ink passage connected with an ink jet printer head when you have not noticed that ink was lost but it is used for it since consumption changes with each colors is lost, it becomes a cavity and it switches to the following ink container, the cavernous section cannot be buried in ink, but air will go to a head as it is, and it will be in the condition of an ink piece. Although the stage of ink container exchange is managed checking an ink residue with an ink residue detector in order to avoid that such a situation occurs, in order for there to be also no object which can also trust an ink residue detector completely, the present condition is having had to authorize whether a detector having operated normally at a fixed period, and considerably accompanied by complicatedness. Moreover, the present condition is having not only by the ink residue detector but by the hand, and performing the check at the feel of weight. The ink residue could be seen without depending on such a complicated ink residue detector, and development of the ink container and cartridge which the color of ink can check by direct viewing was desired with the ink container into which air bubbles cannot go easily.

[0008] In order to push into joining to the ink output port and the ink feed zone of an ink jet recording device which have been attached at the tip of an ink stowage as indicated by JP,4-347653,A when equipping an ink jet recording device with the ink cartridge which contained the mass ink stowage, since the reinforcement which bears the force to push in was required for an ink cartridge and it had it, it was made by injection molding using thermoplastic resin. However, from the environmental situation of these days, when these gestalten considered the abandonment processing after use, since the environmental load was large, in order for there to be nothing, the ink jet recording apparatus could be equipped easily and development of an ink cartridge with a small environmental load was desired with the gestalt never liked.

[0009]

[Problem(s) to be Solved by the Invention] Therefore, it is in this invention offering the ink cartridge which contains offer of an ink container with the ink derivation section which can check the color of ink visually since an ink residue can be checked visually and incorrect wearing is prevented, and an ink stowage, and said ink container aiming at environmental load reduction, without oxygen permeability changing in a handling process.

[0010]

[Means for Solving the Problem] It is attached to a means to attain this invention, and states below.

[0011] 1) The ink cartridge characterized by being made from the thermoplastic film whose rigidity the average transmission coefficient of a visible wavelength field is 88% or more, and the spectral transmittance of a visible wavelength field is 86% or more, and is 7.9×10^{-7} to 1.9×10^{-7} Nm² in the ink cartridge which contained the ink container which has the ink derivation section and an ink stowage with the multilayer configuration film with which an ink stowage has at least one layer of inorganic vacuum evaporation layers.

[0012] 2) An ink cartridge given in 1 characterized by to have the ink takeoff connection which prepared opening which carries out punching opening with an ink supply means of an ink-jet recording apparatus to by which the ink derivation section consists of a joint which has ink installation tubing which joins the ink stowage attached to the base material and this base material, and an applied part to the ink feed zone of an ink jet recording apparatus, and is further positioned by [of this applied part and the ink feed zone of an ink-jet recording apparatus] dashing, and being attached and hit against a field.

[0013] 3) An ink cartridge given in 1 characterized by having arranged said two or more combination crevices for incorrect wearing prevention which dash and engage with a field peculiar to each ink feed zone of an ink jet recording device, or 2.

[0014] 4) An ink cartridge given in any 1 term of 1-3 which are characterized by the wearing direction to the ink feed zone of an ink jet recording device being bottom Mukai.

[0015] 5) An ink cartridge given in any 1 term of 1-4 which are characterized by the thickest part of a joint

being 5-10mm.

[0016] 6) An ink cartridge given in any 1 term of 1-5 which are characterized by loading a plinth for the ink stowage of an ink container holding horizontally, and being contained.

[0017] 7) An ink cartridge given in any 1 term of 1-6 which are characterized by carrying an ink outflow auxiliary member on an ink stowage, and having contained.

[0018] 8) An ink cartridge given in any 1 term of 1-7 which are characterized by the body of an ink cartridge being made of the paper board of a basis weight 300 - 700 g/m².

[0019] 9) An ink cartridge given in any 1 term of 1-8 which are characterized by the ink cartridge body being made of corrugated paper.

[0020] 10) An ink cartridge given in any 1 term of 1-9 which are characterized by having a window part with the means whose disconnection is enabled at the time of use since the ink residue of the ink container contained by the top face of an ink cartridge body is checked.

[0021] 11) An ink cartridge given in any 1 term of 1-10 which are characterized by having the notching section with the means whose disconnection is enabled at the time of wearing in order to equip the inferior surface of tongue of an ink cartridge body with the ink derivation section of the contained ink container to the ink feed zone of an ink jet recording device.

[0022]

[Embodiment of the Invention] Hereafter, with reference to a drawing, it explains per operation gestalt of this invention. Drawing 1 shows the perspective view of the ink container contained by the ink cartridge. One in drawing shows an ink stowage, 2 shows the ink derivation section, and the ink container has two members, the ink stowage 1 and the ink derivation section 2. 3 shows the top face of the thermoplastic film which is making the ink stowage 1, and 4 shows the inferior surface of tongue of the thermoplastic film which is making the ink stowage 1. 5 and 6 show the seal section for making the ink stowage 1. The seal section 5 shows the seal section at the time of producing the ink stowage 1 by the pin center, large seal method, and in order to make easy to check the residue of the ink contained by the ink stowage 1, it is made so that it may be on an inferior-surface-of-tongue 4 side. This seal section may be in the both sides of an ink stowage by the production approach of the ink stowage 1. 7 shows the base material of the ink derivation section 2. 8 shows a joint with the ink stowage 1 established in the base material 7. The approach of joining the ink stowage 1 to this joint 8 is joinable by carrying out seal adhesion with heat joining, adhesives, etc., after inserting a joint 8 in the ink stowage 1. 9 shows the seal section which joined the ink stowage 1 to the joint 8. 10 shows the applied part to the ink feed zone 1 of an ink jet recording device. 11 shows the tubed ink takeoff connection prepared in the applied part 10. 12a shows the hole which carries out fitting immobilization of the omission prevention member of the ink leakage prevention member which constitutes this ink takeoff connection, and although not shown, it has established it in the opposite side as 1 more 12b in this Fig. 13 shows the member which seals the flow control section. After producing the ink derivation section 2 as an approach of sealing, aluminum foil may be laminated and you may seal by heat joining by the member, and it does not matter when producing the ink derivation section 2, even if it seals by insert molding to coincidence. In addition, the ink stowage 1 makes anterior part the side which has attached the ink derivation section 2, and makes the opposite side a posterior part. The ink derivation section 2 uses as a rear face the side which has attached the joint 8, and uses the opposite side as a front face.

[0023] Drawing 2 shows the perspective view of the ink container which used the ink derivation section 2 for environmental load reduction. The sign in drawing is synonymous with drawing 1.

[0024] Drawing 3 shows the sectional view in alignment with A-A' of the ink derivation section 2 shown in drawing 1. 14 in drawing shows the ink reservoir made inside the tubed ink takeoff connection 11, and is isolated with the exterior by the sheet metal 15 united with the wall of the ink takeoff connection 11. The ink supply means of an ink jet recording apparatus is inserted by equipping so that an ink outflow may become an ink jet recording apparatus downward, and 16 shows opening by which opening is carried out in punching. Supply to an ink jet recording device is attained in the ink of an ink reservoir 14 in the ink leakage prevention member which prevents ink leakage producing it when sheet metal 15 is punched by the ink supply means of an ink jet recording device and 17 carries out opening being shown, and the ink supply means of an ink jet recording device punching this ink leakage prevention member 17, and punching sheet metal 15. The wall of opening and the configuration continuously stuck to a line at least are sufficient as the configuration of this ink leakage prevention member 17, and there may be in the configuration continuously stuck by the shape of a field. 18 shows the omission prevention member of the ink leakage prevention member 17. 19 shows ink installation tubing formed in the joint 8, this ink installation tubing 19 is open for free passage with the ink reservoir 14, and the ink of the ink stowage 1 is accumulated in an ink reservoir 14 with said ink installation tubing 19. 20a and 20b show the incorrect wearing prevention concave section engaged peculiar to each ink

feed zone of the ink jet recording apparatus which runs against the applied part of the ink feed zone of the ink jet recording apparatus of an applied part 10, and which dashed and was formed in the field. This incorrect wearing prevention concave section is inserted in because the die length of the convexity attached to the ink jet recording apparatus side and arrangement are in agreement in case at least one place is made deep according to said class of ink which dashes, and two or more arrangement is carried out in the field, and was contained by the ink container and an ink jet recording apparatus is equipped with the ink cartridge of this invention, and wearing has come to be able to do it. Other signs are synonymous with drawing 1.

[0025] Drawing 4 shows the sectional view in alignment with A-A' of the ink derivation section 2 shown in drawing 2. The incorrect wearing prevention concave section which runs against the applied part of the ink feed zone of an ink jet recording device and which was attached and was prepared in the reliance side is shown by the inside 20c and 20d of drawing. In case this concave section has the function of ink cartridge incorrect wearing prevention and an ink jet recording device is equipped with the ink cartridge of this invention, it is vacating a punched hole, and the concave section arranged by the class of ink with which it filled up is inserted in because it is in agreement with arrangement of the convexity attached to the ink jet recording device side, and wearing has come to be able to do it. Other signs are synonymous with drawing 3.

[0026] Drawing 5 is the schematic diagram of the ink leakage prevention member 17. (a) shows the type which carries out complete continuation contact with the wall of opening, (b) shows the type in which the wall and partial side of opening carry out continuation contact, and (c) shows the type which carries out continuation contact by the wall and line of opening. (d) shows the deformation of a type expressed with (a), (e) shows the deformation of a type expressed with (b), and (f) shows the deformation of a type expressed with (c). 21 in drawing shows the part which receives the omission prevention member 18, and 22 shows the part in contact with the wall of opening.

[0027] Drawing 6 shows the schematic diagram of the omission prevention member 18. 23 in drawing shows the body of an omission prevention member, and 24a and 24b show the pawl formed in the outer wall of a body. This pawl is inserted in the holes 12a and 12b which were able to open the omission prevention member 18 in opening, and is fixed.

[0028] Drawing 7 shows the schematic diagram which looked at the ink derivation section 2 shown in drawing 1 from the inferior surface of tongue. Eight in drawing is a joint shown above, and is attached in the rear face of a base material 7, and parallel. 20a and 20b show an example of arrangement of the ink cartridge incorrect wearing prevention concave section like the above. 8b shows the inferior surface of tongue of a joint 8. In order that 25 may join the ink stowage 1 firmly by the joint 8, the concave slot established in inferior-surface-of-tongue 8b of a joint 8 is shown, this slot is established also in top-face 8a (not expressed in this Fig.) of a joint 8, and at least one is prepared in the vertical side. Other signs are synonymous with drawing 1.

[0029] Drawing 8 shows the schematic diagram which looked at the ink derivation section 2 shown in drawing 2 from the inferior surface of tongue. The sign in drawing is synonymous with drawing 7.

[0030] Drawing 9 shows the schematic diagram which looked at the ink derivation section 2 shown in drawing 1 from the joint 8 side. Mutually, the field of the shape of two radii where 8 in drawing c shows the field inserted in the ink stowage 1 of a joint 8, and this field makes joint top-face 8a and inferior-surface-of-tongue 8b is carrying out the field configuration which crosses at an acute angle and is made, and is the rear face of a base material 7, and an parallel field. theta and theta' shows the include angle of the location at which the field of the shape of two radii crosses an acute angle. m shows the greatest thickness of a joint 8 and r shows the diameter of ink installation tubing. 12b shows the hole established in opening 16, in order to insert in the pawl 24 formed in the omission prevention member 18 since the omission prevention member 18 was fixed to opening 16.

[0031] Drawing 10 is the distorted geometry of field 8c of a joint 8. (a) shows the case where field 8c is a slant face, and (b) shows the case where field 8c curves inside.

[0032] Drawing 11 shows the schematic diagram which looked at the ink derivation section 2 shown in drawing 2 from the joint 8 side. The sign in drawing is synonymous with drawing 9.

[0033] Drawing 12 shows the sectional view in alignment with B-B' of the ink derivation section 2 shown by drawing 1. 19 in drawing shows ink installation tubing, as shown above, and it is open for free passage with the ink reservoir 14 so that the medial axis of an ink reservoir 14 and the medial axis of the ink installation tubing 19 may intersect perpendicularly. Other signs are synonymous with drawing 1, and 3, 7 and 6.

[0034] Drawing 13 shows the perspective view of an ink cartridge, (a) shows the perspective view which looked at the top face, and (b) shows the perspective view which looked at the inferior surface of tongue. 26 in drawing shows an ink cartridge body. 26a shows a top face and 26b shows an inferior surface of tongue. 27 shows the window part the ink residue prepared in top-face 26a, and for an ink color check, and it is possible

in the case of use to extract along with the perforation 28 attached to the perimeter by pushing a window part. 29 shows the end chip section prepared in inferior-surface-of-tongue 26b of an ink cartridge, in order to join the ink cartridge of this invention to the ink feed zone of an ink jet recording apparatus. It is possible in the case of use to extract along with the perforation 28 attached to the perimeter by pushing.

[0035] Drawing 14 shows the outline sectional view in alignment with A-A' of the ink cartridge shown in drawing 13. 30 in drawing shows the loading section of a plinth which carries the ink stowage 1. In order to reduce the ink residue of the ink stowage 1 as much as possible, as for the height of a plinth, it is desirable to double so that the inferior surface of tongue 4 of the ink stowage 1 may become the almost same height as inferior-surface-of-tongue 8b of a joint 8, and height is the same before and behind the ink stowage 1. 31 shows the outflow auxiliary member for reducing supply assistance of ink and an ink residue as much as possible. Other signs are synonymous with drawing 1.

[0036] Drawing 15 (a) and (b) show the outline sectional view of a plinth in alignment with B-B' of the ink cartridge shown in drawing 13. 32 shows the side attachment wall of a plinth. 30 shows the loading section. In (a), the loading section 30 is making the structure of H mold from being fixed to this side attachment wall by inserting both sides in this side attachment wall partially. In (b), a side attachment wall 32 and the loading section 30 are made from making the member bent in U mold rival, and the structure of H mold is made. h shows the height of installation of the loading section 30 from the lower part of a side attachment wall 32.

[0037] Drawing 16 shows the development view of the ink cartridge body 26. 33 in drawing shows the punching section which avoids the ink takeoff connection 11. Other signs are synonymous with drawing 13.

[0038] Below, it is attached to each part material which constitutes the ink cartridge of this invention, and states. It is attached to the multilayer film which has the inorganic vacuum evaporatio no layer used for this invention, and explains. The multilayer film which has the inorganic vacuum evaporatio no layer used for this invention has at least one-layer inorganic vacuum evaporatio no layer, and shows the multilayer thermoplasticity film with which the laminating of the thermoplastic film was carried out up and down through this inorganic vacuum evaporatio no layer. The average transmission coefficient of a visible wavelength field of this multilayer thermoplasticity film is 88% or more, and the spectral transmittance of a visible wavelength field is 86% or more. At less than 88%, visual inspection of an ink residue becomes [the average transmission coefficient of a visible wavelength field] difficult, and there is risk of the spectral transmittance of a visible wavelength field making a mistake in the shade color of ink at less than 86%. Since the class of ink used for the ink jet printer which creates the image of large size recently has risk of taking the color of the ink contained in the ink container at the time of ink cartridge exchange since red, yellow, blue, and black shade ink are prepared also in the same color from it being required that color reproduction should be performed faithfully, it must fully be careful of it and it must avoid incorrect wearing.

[0039] The rigidity of the multilayer thermoplasticity film used for this invention has 7.9×10^{-7} to 1.9×10^{-7} to 7 desirable Nm², and it is 6.7×10^{-7} to 3.1×10^{-7} Nm² more preferably. There is risk of it being difficult to make a multilayer thermoplasticity film with low oxygen permeability from less than two 1.9×10^{-7} to 7 Nm, junction to the joint 8 of the ink derivation section 2 becoming weak, a junction part losing the vibration at the time of transportation, handling, etc., and ink leakage occurring. Moreover, when 7.9×10^{-7} to 7 Nm² is exceeded, it is not desirable in order, and to be hard to deal with it, and a wrinkle becomes easy to be made within an ink cartridge and to remain in a wrinkle in ink.

[0040] The thickness of the multilayer thermoplasticity film used for this invention maintains the rigid desirable range in relation to said rigidity, and 73-123 micrometers of thickness are desirable, and it is 83-113 micrometers more preferably. In less than 73 micrometers, the reinforcement as an ink container runs short and there is risk of a junction part with the joint 8 of the ink derivation section 2 losing the vibration at the time of transportation, handling, etc., and ink leakage occurring. It is not desirable in order to tend to make a wrinkle, to become within an ink cartridge as preferably [handling is difficult and] as the joining process after ink restoration, and a derivation section fitter and to remain in a wrinkle in ink in an ink container production process, when 123 micrometers is exceeded. Moreover, when 123 micrometers is exceeded, it also becomes superfluous quality, and an environmental load increases and is not desirable at the time of abandonment as a result.

[0041] The **** inorganic film indicated by the thin film handbooks p879-p901 (Japan Society for the Promotion of Science), the vacuum-technology handbooks p502-p509, p612 and p810 (Nikkan Kogyo Shimbun), and the vacuum handbook **** versions p132-p134 (ULVAC Japan vacuum technology K [K]) as inorganic substance vacuum evaporatio no film used for the multilayer thermoplasticity film of this invention is raised. For example, Cr 2O₃, Ta₂O₃, ZrN, SiC, TiC and PSG, Si₃N₄, a single crystal Si, an amorphous silicon, W, and Al₂O₃ grade are used. As most desirable inorganic substance vacuum evaporatio no film also in these, an alumina (Al₂O₃) is mentioned from the point of transparency in the strength of the vacuum evaporatio no

film. **** indicated by a vacuum-technology handbook and package technical Vol29No.8 as an approach of making the inorganic vacuum evaporatio film -- a general approach, for example, resistance, or a radio frequency heating method, and an electro beam (EB) -- it can make by law, the plasma (PCVD), etc. As thickness of the vacuum evaporatio film, the range of 400-2000Å is desirable, and the range of it is 500-1800Å more preferably.

[0042] The film material currently used for common films for a package, such as an ethylene tetrafluoro ethyl copolymer (ETFE), high density polyethylene (HDPE), biaxial extension polypropylene (OPP), polystyrene (PS), polymethylmethacrylate (PMMA), extension nylon 6 (ONy), polyethylene terephthalate (PET), a polycarbonate (PC), polyimide, and polyether styrene (PES), as a thermoplastics film used as a base material of the inorganic vacuum evaporatio layer of this invention can be used.

[0043] The low density polyethylene which is the high polymer film (for example, high polymer film of functional wrapping Given in a new expansion Toray Industries Research center) currently used as wrapping general as a thermoplastics film used through a vacuum evaporatio film sheet (LDPE), high density polyethylene (HDPE) and a line -- low density polyethylene (LLDPE) -- Medium density polyethylene, non-extended polypropylene (CPP), extension polypropylene (OPP), Extension nylon (ONy), polyester (PET), cellophane, polyvinyl alcohol (PVA), extension Vinyon (OV), an ethylene-vinylacetate copolymer (EVOH), a vinylidene chloride (PVDC), etc. can be used.

[0044] Moreover, naturally the multilayer film made from a different-species film and co-extrusion if needed, the multilayer film which change an extension include angle, it was made to rival and made it can be used for these thermoplasticity film. Furthermore, naturally it is also possible to make combining the consistency of the film used in order to acquire the physical properties of wrapping to need, and molecular weight distribution. as the thermoplastic film of an innermost layer -- low density polyethylene (LDPE) and a line -- the low density polyethylene (LDPE) manufactured using low density polyethylene (LLDPE) and a metallocene catalyst, and a line -- the film low density polyethylene (LLDPE), and these films and a high-density-polyethylene (HDPE) film carried out [the film] mixed use is used. If LLDPE manufactured from the point of melting temperature and reinforcement also in these, especially using a metallocene catalyst is generally marketed preferably, it can fully be used. For example, the regent floor line made from HAMO REXX LL made from YUMERITTO by Ube Industries, Ltd., Dow Chemical Japan AFFINITY, the elite, and Japanese Polyolefine, Japan Polychem kernel 57L, EBORYU by Mitsui Chemicals, Inc., the RAMIRON supermarket made from Sekisui Film Western part of Japan, SE series by TAMAPOLY CO., LTD., toe cello [by TOH CELLO CO., LTD.] T.U.X-FCS, T.U.X-TCS, and Nimura Chemical industry, the METARO ace by Mitsubishi Chemical Kohjin PAX Corp., WMX made from Wada Chemical industry, and FVby Sumitomo Chemical Co., Ltd.202 grade are mentioned.

[0045] It can choose suitably from above-mentioned thermoplastic films, and when not using an inorganic substance vacuum evaporatio layer, if needed, a simple substance is sufficient, or the laminating of two or more sorts of films can be carried out, and they can be used. For example, CPP/OPP, PET/OPP/LDPE, Ny/OPP/LDPE, CPP/OPP/EVOH, saran UB/LLDPE(here shows biaxial oriented film which used vinylidene-chloride / acrylic ester system copolymerization resin by Asahi Chemical Industry Co., Ltd. as raw material in Saran UB) K-OP/PP, K-PET/LLDPE, K-Ny/EVA (K shows the film which carried out the coat of the vinylidene chloride resin here), etc. are used.

[0046] It is possible for various kinds of approaches learned as the manufacture approach of the above-mentioned laminated film by the general **** target indicated by the 40-48 pages of the KOMBA tech 1990. May issues to be used, for example, to make using the wet laminating method, the dry laminate method, the hot melt laminating method, the extrusion laminating method, and the heat laminating method. Depending on the material of construction, it can make with a multilayer inflation method.

[0047] In case a laminating is carried out, as adhesives used, the 18-22 pages of the KOMBA tech 1996. January issues, 13-17 pages of 1997. October issues, and the adhesives known by the general **** target indicated by 21-25 pages can be used.

[0048] Although especially limitation does not have the quality of the material used for the ink derivation section 2 of this invention, it is most desirable to use thermoplastics from a cost side and the field of the ease of making. Practical use plastics fabrication handbook also with the very common manufacture approach It can manufacture by the **** injection-molding approach indicated by the volume on all Japan plastic-molding industrial union meeting. If injection molding can be done as thermoplastics to be used, although there is especially no limitation, it can use common resin, such as polyethylene, polystyrene, a polyamide, polyacetal, a polycarbonate, and polypropylene. The **** block configuration shown in drawing 1 as a configuration of the ink derivation section 2 is sufficient, and it does not matter as shown in drawing 2, even if it is the configuration where it left only the need part for environmental load reduction.

[0049] The general natural rubber as a leakage prevention member 17 of the ink inserted in the opening 16 of the ink takeoff connection 11 prepared in the applied part 10 of the ink derivation section 2 of this invention, synthetic rubber, etc. are mentioned. As synthetic rubber, it is possible to use styrene-butadiene-rubber, polyisoprene-rubber, isobutylene-isoprene-rubber, polyurethane rubber, silicone rubber (poly dimethylsiloxane), vinyl silicone rubber, phenyl silicone rubber, silicone rubber, etc. fluoride, for example.

[0050] It does not use up without removing from an applied part until ink will be lost, if an ink jet recording device is equipped once as a direction using the ink cartridge of this invention, but attachment and detachment are repeated and used frequently. For example, when moving by Nighttime uninhabited, in order to avoid that an ink piece arises on the way, it exchanges for a new article, and the cartridge which was being used to the middle is used, equipping another ink jet recording device. Since the leakage prevention member 17 of the ink put in opening 16 for every this time is punched by the ink supply means of an ink jet recording device, it may deteriorate and may produce ink leakage.

[0051] As a physical chemistry property required of the leakage prevention member-17 of these ink, it is required at the time of punching by the ink supply means of an ink jet recording device that punching (10 times or more) of that there is no generating of dust and a repeat should be borne. As most desirable member in the above-mentioned member, silicone rubber (poly dimethylsiloxane) is mentioned from this point. Moreover, 4-8mm of thickness is desirable, and it is 5-7mm more preferably. when the count of punching of a repeat needed in less than 4mm cannot be borne and 8mm is exceeded, while punching becomes difficult with the ink supply means of an ink jet recording device and workability worsens -- an ink supply means -- being long (for example, a needle becoming long) -- since the flow of ink worsens, it is not desirable. The configuration of the silicone rubber (poly dimethylsiloxane) used for this invention can be made by the press-forming approach generally learned.

[0052] Although it will not limit especially if it has elasticity as an omission prevention member 18 of the leakage prevention member 17 of ink, low density polyethylene (LDPE), high density polyethylene (HDPE), polypropylene (PP), polystyrene (PS), etc. are mentioned, for example, and LDPE, HDPE, etc. are especially mentioned as a desirable ingredient. The configuration of the omission prevention member 18 used for this invention can be made by the injection-molding approach generally learned.

[0053] Thickness m of the joint 8 prepared in the base material 7 of the ink derivation section 2 of this invention has 5-10 desirablemm, and it is 6-9mm more preferably. In the case of less than 5mm, there is risk of installation reinforcement with a base material 7 becoming weak, and damaging by the manufacture process, transportation, etc. Moreover, an ink residue increases and is not desirable when 10mm is exceeded. The diameter of ink installation tubing formed in a joint 8 has 1-6 desirablemm. When the diameter of ink installation tubing forms the ink installation tubing 19 with regards to the thickness of said joint 8, Since it is required for the thickness which can form the concave slot 25 established in top-face 8a of a joint 8 and inferior-surface-of-tongue 8b in order to join firmly the ink stowage 1 established in said joint 8 by the joint 8 to be maintainable, It is required to double with the thickness of a joint 8 and to decide the diameter of the ink installation tubing 19 suitably. Since less than 1mm of the diameter of the ink installation tubing 19 is enough as an ink outflow, it is lost, 10mm even in thickness of a joint 8 can form said concave slot 25 and it is lost when 6mm is exceeded preferably, it is not desirable.

[0054] After making the tubed ink stowage 1 first using said multilayer thermoplasticity film as an approach of making the ink container shown in drawing 1 and drawing 2 which are used for this invention and attaching the derivation section 2 in one side of a clear aperture, it can manufacture by filling up ink with the bottom of reduced pressure conditions from other clear apertures, and sealing with heat joining or adhesives. As an approach of making a tubed ink stowage, for example, the method of pasting up the long side side of said multilayer thermoplasticity film of two sheets of one rectangle with heat joining or adhesives, 2) How to rig from the center of straight side of said rectangular multilayer thermoplasticity film of one sheet, and to paste up both the long side side with heat joining or adhesives, 3) Although how to rig from ***** of said rectangular multilayer thermoplasticity film of one sheet, and to paste up a long side side with heat joining or adhesives can be considered, it is possible to choose the approach of being the easiest to make suitably, and to make it. After inserting in the ink stowage 1 the joint 8 attached in the base material 7 of the ink derivation section 2 as an approach of attaching the ink derivation section 2 in a drum section, an ink container is done by pasting up with heat joining or adhesives. After the ink derivation section 2 is attached, the ink container which filled up ink with filling up ink with the bottom of reduced pressure conditions, and carrying out seal adhesion with heat joining or adhesives from other clear aperture side is done.

[0055] Although especially limitation does not have the ingredient used for making the plinth of drawing 14 used for this invention, and the ink container shown by drawing 15, it is desirable to double with the quality of the material of the ink cartridge body 26 or the quality of the material of the ink derivation section 2 in

consideration of the recycle after use. In order to reduce the ink residue in an ink container, it is carrying out the important role, and 20 – 100% of the height of the loading section 30 of a plinth is desirable to the height of inferior-surface-of-tongue 8b of a joint 8, and is 50 – 100% more preferably. Since the ink stowage 1 falls from a joint 8 when ink has decreased in number, an ink residue will increase, and when 100% is exceeded, in order to raise the ink derivation section 2, it will become impossible to contain an ink container on the ink cartridge body 26 at less than 20%. Moreover, the fixed thing of the height of the loading section 30 is desirable. When an inclination is attached so that it may become low towards a joint 8, since there is risk of a load being applied to a joint at the time of transportation, and the adhesion side of a joint 8 and an ink stowage being damaged, there is nothing preferably.

[0056] Although especially limitation does not have the ingredient used for making the outflow auxiliary member 31 shown by drawing 14 used for this invention, it is desirable to double with the quality of the material of the ink cartridge body 26, the quality of the material of the ink derivation section 2, and the quality of the material of a plinth in consideration of the recycle after use. 47 – 100% of the magnitude of the outflow auxiliary member 31 is desirable to the breadth of the ink stowage 1, and is 63 – 95% more preferably. At less than 47%, it becomes difficult to impose a load on an ink stowage equally. When 100% is exceeded, it becomes difficult to collide with the side attachment wall 32 of a plinth. 65 – 100% is desirable to the dip of the ink stowage 1, and it is 87 – 100% more preferably. At less than 65%, it becomes difficult to impose a load on an ink stowage equally. When 100% is exceeded, the receipt to an ink cartridge leads [become difficult, and a superfluous ingredient will be used and] to the increment in an environmental load and is not desirable.

[0057] as a body 26 of the ink cartridge which contained the ink container which has the ink derivation section 2 and the ink stowage 1 of this invention, it is a product made of paper from the field of environmental load reduction — desirable — the newest paper processing handbook **** indicated by the incorporated company tech Times — it is possible to make using the white board or corrugated paper which is the common paper board. As the paper board, a basis weight 300 – 700 g/m² are desirable, and are 400 – 600 g/m² more preferably. In less than two 300 g/m, the reinforcement which is equal to handling and transportation cannot be maintained, the workability when manufacturing the ink cartridge body 26, when 700 g/m² is exceeded is bad, and becomes superfluous quality, and an environmental load increases and is not desirable. Its 260–1140 micrometers are desirable, and it is 480–920 micrometers more preferably, and it becomes [are packaged excessively and / an environmental load] large and is not desirable [thickness], when it becomes impossible to have maintained the reinforcement which is equal to handling and transportation in less than 260 micrometers and 1140 micrometers is exceeded.

[0058] as corrugated paper — the newest paper processing handbook **** indicated by the incorporated company tech Times — although the double faced corrugated fiberboard of common A flute – E flute and a double wall corrugated fiberboard are used preferably, there is especially no limitation. According to the magnitude of an ink container, it can choose suitably.

[0059] Although there is no format of the ink cartridge body 26, it may suit in the **** format indicated by JISZ1507, and especially limitation is the newest paper processing handbook. Incorporated company tech Times You may be the **** format indicated by P821–824.

[0060] You may be the method which sticks on the ink cartridge front face of this invention the label with which the display for an indication for identifying inner ink being given, displaying by direct printing on the surface of a cartridge as the method of presentation, and identifying was performed.

[0061]

[Example] Hereafter, although an example explains this invention concretely, there is no this invention what is limited to these.

[0062] The ink container was produced using the ingredient shown in one or less example.

[0063] As ink stowage ingredient 1.ONy15micrometer/alumina vacuum evaporationno PET12 micrometer/LLDPE 60micrometer2.ONy15micrometer/silica vacuum evaporationno PET12 micrometer/LLDPE 60micrometer3.ONy15 micrometer/PET 25 micrometer/LLDPE 60micrometer alumina vacuum evaporationno PET12micrometer, BARRIALOX1011HGCS made from Oriental Metallizing was used. As silica vacuum evaporationno PET12micrometer, GL-E by Toppan Printing Co., Ltd. was used. The Sumitomo Chemical Co., Ltd. wire production-like low density polyethylene FV202 made using a metallocene catalyst as LLDPE was used.

[0064] The oxygen permeability of the above-mentioned ink stowage ingredient and permeability are shown in Table 1.

[0065]

[Table 1]

インク収納部 材料 No.	酸素透過率 ($\text{ml}/\text{m}^2 \cdot \text{atm} 24\text{h} 20^\circ\text{C}$)	透過率 (%)
1	0.4	89
2	0.5	87
3	60	90

[0066] Oxygen permeability is the value measured according to JISK7126. Permeability shows the average transmission coefficient of a light field according to ASTM D1003.

[0067] 1) The ink derivation section 2 shown by ink derivation section drawing 2 was produced by LDPE. In addition, the east was carried out to the ink leakage prevention member 17 of the opening 16 of the ink takeoff connection 11, and Make Silicone rubber SE-1140U was produced and used for the (a) configuration of drawing 5 by press forming. Moreover, the omission prevention member 18 produced the configuration shown by drawing 6 using LDPE.

[0068] 2) The box of the mold shown in the development view of drawing 16 using cartridge body basis-weight 450 g/m² and the paper board with a thickness of 590 micrometers was produced.

[0069] 3) The mold shown by (a) of drawing 15 using the corrugated paper of a plinth E flute was produced. It was made for height h to become 95% to the height of inferior-surface-of-tongue 8b of a joint 8.

[0070] 4) The member with a mass of 25g was produced with the same ingredient as a plinth 87% to the dip 84% to the breadth of an outflow auxiliary member ink stowage.

[0071] After carrying out adhesion immobilization of the ink stowage 1 by the heat joining method at the ink derivation section 2 using the above-mentioned ink stowage ingredient, it checked that ink was filled up with the bottom of reduced pressure conditions, and there were no air bubbles in an ink stowage, the above 2, 3, and 4 was used so that an oxygen density might be set to 2 ppm, and it considered as the sample shown in Table 2.

[0072]

[Table 2]

試料 No.	インク収納部材料 No.	備考
101	1	本発明
102	2	比較
103	3	比較

[0073] After leaving the above-mentioned sample for seven days, the result of having observed the existence of the air bubbles of an ink stowage visually is shown in Table 3. It is a product made from IDEX about the above-mentioned sample. Vibration test machine BF-UA is used, and it makes to perform change with an amplitude of 5-64Hz once in 5 minutes into 1 cycle, and is 6 cycle *****. After leaving it for after [a trial] seven days, the result of having observed the existence of the air bubbles of an ink stowage visually is shown in Table 4.

[0074]

[Table 3]

試料 No.	結果
101	気泡は認められず
102	気泡は認められず
103	気泡が確認された

[0075]

[Table 4]

試料 No.	結果
101	気泡の存在は認められず
102	わずかであるが気泡の存在が確認される
103	気泡が確認された

[0076] In the experiment which assumed the condition of transport although no problem was produced only by leaving it when the ingredient which has a silica vacuum evaporatio layer was used from the above result, although it was presumption, the result considered that the crack arose in the silica vacuum evaporatio layer, and air went into it from there was obtained. Moreover, it checked not turning [neglect] to the ink stowage material of this invention, in order that air may enter, and, as for sample No.103 with large oxygen permeability, the effectiveness of an ingredient with the alumina vacuum evaporatio layer of this

invention was checked.

[0077] When making ink stowage ingredient ONy15micrometer / 60 micrometers of alumina vacuum evaporation PET12 micrometer/LDPE used in the example 2 example 1, the ingredient shown in Table 6 to which permeability was changed by changing and coloring an addition using the various pigments which show LDPE of a sealing layer in Table 5 was produced.

[0078]

[Table 5]

顔料 No.	顔料名	カラーインデックス No.
1	縮合アソエロー	20034
2	縮合アソレッド	20735
3	インダンスレンブルー	69300

[0079]

[Table 6]

材料 No.	顔料 No.	平均透過率(%)	分光透過率(%)	備考
1	無し	90	87	本発明
2	1	89	86	本発明
3	1	88	85	比較
4	1	87	83	比較
5	2	89	86	本発明
6	2	88	84	比較
7	2	86	82	比較
8	3	89	86	本発明
9	3	88	85	比較
10	3	87	83	比較

[0080] The ingredient which the above-mentioned ingredient was used and also was shown in the example 1 was used, and it considered as the sample shown in Table 7.

[0081]

[Table 7]

試料 No.	インク収納部材料 No.	充填インク	備考
201	1	淡い黄色	本発明
202	2	淡い黄色	本発明
203	3	淡い黄色	比較
204	4	淡い黄色	比較
205	5	淡い赤色	本発明
206	6	淡い赤色	比較
207	7	淡い赤色	比較
208	8	淡い青色	本発明
209	9	淡い青色	比較
210	10	淡い青色	比較

[0082] Which mistaking an ink cartridge exchange activity by ten persons' case and the examined result are shown in Table 8 supposing ink with each high concentration having been lost using the above-mentioned sample.

[0083]

[Table 8]

試料 No.	結果
201	0
202	0
203	3
204	7
205	0
206	4
207	8
208	0
209	4
210	7

[0084] The figure of front Naka shows the mistaken number. As shown in an upper table, it was checked that it is effective in incorrect wearing prevention to maintain the average transmission coefficient of the visible wavelength field of this invention, and to maintain the spectral transmittance of a visible wavelength field, and there is.

[0085] When making ink stowage ingredient ONy15micrometer / 60 micrometers of alumina vacuum evaporation PET12 micrometer/LDPE used in the example 3 example 1, the ingredient with which it thickens and rigidity differs as LDPE of a sealing layer is shown in Table 9 was prepared. in addition, rigidity -- the Shimadzu Corp. make -- it is the value measured using hauling tester PSC-100.

[0086]

[Table 9]

材料 No.	LDPE層の厚さ (μm)	剛性 ($\times 10^{-7} \text{Nm}^2$)	備考
1	30	0.75	比較
2	40	1.9	本発明
3	50	3.4	本発明
4	60	4.4	本発明
5	70	5.5	本発明
6	80	6.7	本発明
7	90	7.9	本発明
8	100	9.2	比較

[0087] The above-mentioned ingredient was used, and also the same ingredient as an example 1 was used, and the sample shown in Table 10 was produced.

[0088]

[Table 10]

試料 No.	インク収納部材料 No.
301	1
302	2
303	3
304	4
305	5
306	6
307	7
308	8

[0089] Vibration test machine BF-UA made from IDEX is used for the above-mentioned sample, and it makes to perform change with an amplitude of 5-64Hz once in 5 minutes into 1 cycle, and is 6 cycle *****. A cartridge is opened after a trial and the result of having checked the condition of an ink container visually is shown in Table 11. moreover, the above-mentioned sample -- the Konica Corp. make -- it continues recording by equipping ink jet recording device LF-900, and the ink residue at the time of record becoming impossible (%) is shown in Table 12. In addition, an ink residue (%) shows the value calculated from the following formula.

[0090] Volume $\times 100$ [0091] of an ink residue (%) = ink residue / ink stowage

[Table 11]

試料 No.	結果	判定
301	インク導出部とインク収納部との 接合部からインク漏れが発生	×
302	異常無し	○
303	異常無し	○
304	異常無し	○
305	異常無し	○
306	異常無し	○
307	異常無し	○
308	異常無し	○

[0092] The object which does not have ink leakage as a criterion was made into O, and the object which ink leakage generated was made into x.

[0093]

[Table 12]

試料 No.	インク残量(%)	判定	総合判定
301	1.4	○	×
302	1.6	○	○
303	1.6	○	○
304	1.8	○	○
305	1.8	○	○
306	2.0	○	○
307	2.0	○	○
308	2.2	×	×

[0094] When an ink residue made less than 2% O to the volume of an ink stowage and exceeded 2% as a criterion, it considered as x.

[0095] It has checked that the rigid range of this invention was effective as a comprehensive judgment. The sample which the thickness of the ink leakage prevention member 17 was changed when producing sample No.101 of example 4 example 1, and also completely makes the same, and is shown in Table 13 was produced.

[0096]

[Table 13]

試料 No.	インク漏れ防止部材の厚さ(mm)	備考
401	2	本発明
402	4	本発明
403	6	本発明
404	8	本発明

[0097] the above-mentioned sample -- using it -- the Konica Corp. make -- the result of having performed the desorption trial of an ink cartridge, having left it for 24 hours using the ink jet recording apparatus LF-900 set, and having checked the existence of generating of ink leakage is shown in Table 14.

[0098]

[Table 14]

試料 No.	インク漏れが発生した脱着回数	判定
401	6 回	×
402	10 回	○
403	50 回してもインク漏れ発生せず	○
404	厚くて装着出来ず	×

[0099] Since desorption of an ink cartridge was performed frequently, since it had to guarantee, the effectiveness of this invention was checked at least 10 times.

[0100] The sample which the height (h) of the loading section 30 of the (a) plinth of drawing 15 was changed when producing sample No.101 of example 5 example 1, and also completely makes the same, and is shown in Table 15 was produced.

[0101]

[Table 15]

試料 No.	積載部の高さ(mm)	備考
501	0	本発明
502	5	本発明
503	10	本発明
504	15	本発明
505	19	本発明
506	20	本発明

[0102] the above-mentioned sample -- the Konica Corp. make -- ink jet recording device LF-900 are equipped and the ink residue at the time of continuing recording and record becoming impossible (%) is shown in Table 16. In addition, an ink residue (%) shows the value calculated like the example 3.

[0103]

[Table 16]

試料 No.	インク残量(%)	判定
501	3.0	×
502	2.6	×
503	2.0	○
504	0.2	○
505	0.1	○
506	—	×

[0104] When an ink residue made less than 2% O to the volume of an ink stowage and exceeded 2% as a criterion, it considered as x.

[0105] Since an ink stowage comes below the location of a joint, in the case of sample No.501, an ink residue increases, and it is not desirable. In the case of sample No.506, since the loading section was able to become high and became unable to contain an ink container from the height of the joint of the ink derivation section to a cartridge, a trial was not completed.

[0106] The sample which the dimension of an outflow auxiliary member was changed when producing sample No.308 of example 6 example 3, and also completely makes the same, and is shown in Table 17 was produced.

[0107]

[Table 17]

試料 No.	インク収納部の横幅、縦幅に対する割合(%)		備考
	横幅	縦幅	
601	42	87	本発明
602	47	87	本発明
603	53	87	本発明
604	63	87	本発明
605	74	87	本発明
606	84	87	本発明
607	95	87	本発明
608	100	87	本発明
609	105	87	本発明
610	84	30	本発明
611	84	49	本発明
612	84	68	本発明
613	84	100	本発明

[0108] the above-mentioned sample -- the Konica Corp. make -- ink jet recording device LF-900 are equipped and the ink residue at the time of continuing recording and record becoming impossible (%) is shown in Table 18. In addition, an ink residue (%) shows the value calculated like the example 3.

[0109]

[Table 18]

試料 No.	インク残量(%)	判定
601	2.6	×
602	2.0	○
603	1.8	○
604	1.6	○
605	1.6	○
606	1.4	○
607	1.4	○
608	1.4	○
609	—	×
610	2.2	×
611	2.2	×
612	2.0	○
613	1.8	○

[0110] When an ink residue made less than 2% O to the volume of an ink stowage and exceeded 2% as a criterion, it considered as x.

[0111] As shown in an upper table, it was checked that the dimension of the outflow auxiliary member of this invention is effective.

The sample which thickness m of a joint 8 and the diameter of the ink installation tubing 19 which are prepared in the ink derivation section 2 were changed when producing sample No.101 of example 7 example 1, and also completely makes the same, and is shown in Table 19 was produced.

[0112]

[Table 19]

試料 No.	接合部の厚さ (mm)	インク導入管の直径 (mm)	備考
701	4	1	比較
702	5	1	本発明
703	5	2	本発明
704	6	1	本発明
705	6	2	本発明
706	7	2	本発明
707	7	3	本発明
708	8	2	本発明
709	8	3	本発明
710	9	4	本発明
711	9	5	本発明
712	10	5	本発明
713	10	6	本発明
714	11	6	比較

[0113] Vibration test machine BF-UA made from IDEX is used for the above-mentioned sample, and it makes to perform change with an amplitude of 5-64Hz once in 5 minutes into 1 cycle, and is 6 cycle *****. A cartridge is opened after a trial and the result of having checked the condition of an ink container visually is shown in Table 20. the above-mentioned sample -- the Konica Corp. make -- ink jet recording device LF-900 are equipped and the ink residue at the time of continuing recording and record becoming impossible (%) is shown in Table 21. In addition, an ink residue (%) shows the value calculated like the example 3.

[0114]

[Table 20]

試料 No.	インク容器の状態	判定
701	基材と接合部と取り付け箇所にひび発生が認められる	×
702	異常無し	○
703	異常無し	○
704	異常無し	○
705	異常無し	○
706	異常無し	○
707	異常無し	○
708	異常無し	○
709	異常無し	○
710	異常無し	○
711	異常無し	○
712	異常無し	○
713	異常無し	○
714	異常無し	○

[0115]

[Table 21]

試料 No.	インク残量(%)	判定	総合判定
701	1.5	○	×
702	1.6	○	○
703	1.6	○	○
704	1.6	○	○
705	1.6	○	○
706	1.6	○	○
707	1.6	○	○
708	1.7	○	○
709	1.7	○	○
710	1.7	○	○
711	1.8	○	○
712	1.8	○	○
713	2.0	○	○
714	3.0	×	×

[0116] When an ink residue made less than 2% O to the volume of an ink stowage and exceeded 2% as a criterion, it considered as x. As shown in an upper table, it was checked that the thickness of the joint of this invention is effective.

[0117]

[Effect of the Invention] As described above, it can exchange, without according to claim 1 of this invention, mistaking the color of ink at the time of exchange of an ink cartridge, since it excels in transparency, and the check of an ink residue is also easy, and the ink container which lessens an ink residue has been offered.

[0118] According to claim 2, positioning at the time of wearing to the ink feed zone of an ink jet recording device became easy.

[0119] According to claim 3, incorrect wearing of an ink cartridge was lost. According to claim 4, wearing to the ink feed zone of an ink jet recording device became easy.

[0120] According to claim 5, the installation reinforcement of a joint was maintained and it became possible to lessen an ink residue.

[0121] According to claim 6, while the ink leakage from a joint was also lost at the time of transportation, it became possible to lessen an ink residue.

[0122] According to claim 7, it became possible to lessen an ink residue. According to claim 8, environmental load reduction was attained.

[0123] According to claim 9, environmental load reduction was reduced and selection of an ingredient spread. According to claim 10, it became possible to be able to check an ink residue and the color of ink visually.

[0124] According to claim 11, prevention became possible about penetration of the dust into the ink cartridge at the time of preservation at the time of transportation.

[Translation done.]

* NOTICES *

JPO and INPIT are not responsible for any damages caused by the use of this translation.

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.**** shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] The perspective view of an ink container.

[Drawing 2] The perspective view of the ink container which used the ink derivation section for environmental load reduction.

[Drawing 3] The sectional view in alignment with A-A' of the ink derivation section shown in drawing 1 .

[Drawing 4] The sectional view in alignment with A-A' of the ink derivation section shown in drawing 2 .

[Drawing 5] The schematic diagram of an ink leakage prevention member.

[Drawing 6] The schematic diagram of an omission prevention member.

[Drawing 7] The schematic diagram which looked at the ink derivation section shown in drawing 1 from the inferior surface of tongue.

[Drawing 8] The schematic diagram which looked at the ink derivation section shown in drawing 2 from the inferior surface of tongue.

[Drawing 9] The schematic diagram which looked at the ink derivation section shown in drawing 1 from the joint side.

[Drawing 10] Distored geometry of the field of a joint.

[Drawing 11] The schematic diagram which looked at the ink derivation section shown in drawing 2 from the joint side.

[Drawing 12] The sectional view in alignment with B-B' of the ink derivation section.

[Drawing 13] The perspective view of an ink cartridge. For (a), (b) is the perspective view which looked at the top face, and the perspective view which looked at the inferior surface of tongue.

[Drawing 14] The outline sectional view in alignment with A-A' of an ink cartridge.

[Drawing 15] (a) and (b) are the outline sectional view of a plinth in alignment with B-B' of an ink cartridge.

[Drawing 16] The development view of an ink cartridge body.

[Description of Notations]

1 Ink Stowage

2 Ink Derivation Section

3 Top Face of Thermoplastic Film

4 Inferior Surface of Tongue of Thermoplastic Film

5 Six Seal section

7 Base Material

8 Joint

10 Applied Part

11 Ink Takeoff Connection

14 Ink Reservoir

16 Opening

17 Ink Leakage Prevention Member

18 Omission Prevention Member

19 Ink Installation Tubing

24a, 24b Pawl

26 Ink Cartridge Body

27 Window Part

28 Perforation

30 Loading Section of Plinth

31 Outflow Auxiliary Member

32 Side Attachment Wall of Plinth

33 Punching Section

[Translation done.]